

# **Preparedness**

## **One Health Approach**

Dr. Chadia Wannous

Coordinator

Towards A Safer World Network  
(TASW)

# This presentation

- Global Changes affecting human and animal health
- Risk Drivers of EID
  - Land use change: deforestation and urbanization
  - Climate change: impact on health, examples of VBD
  - Weather-related disasters
- Magnitudes of EID, Timeline of outbreaks and their human and economic impact
- Risk Reduction concept and aspects
- Preparedness
- Solutions in integration and the One Health Approach
- Final message

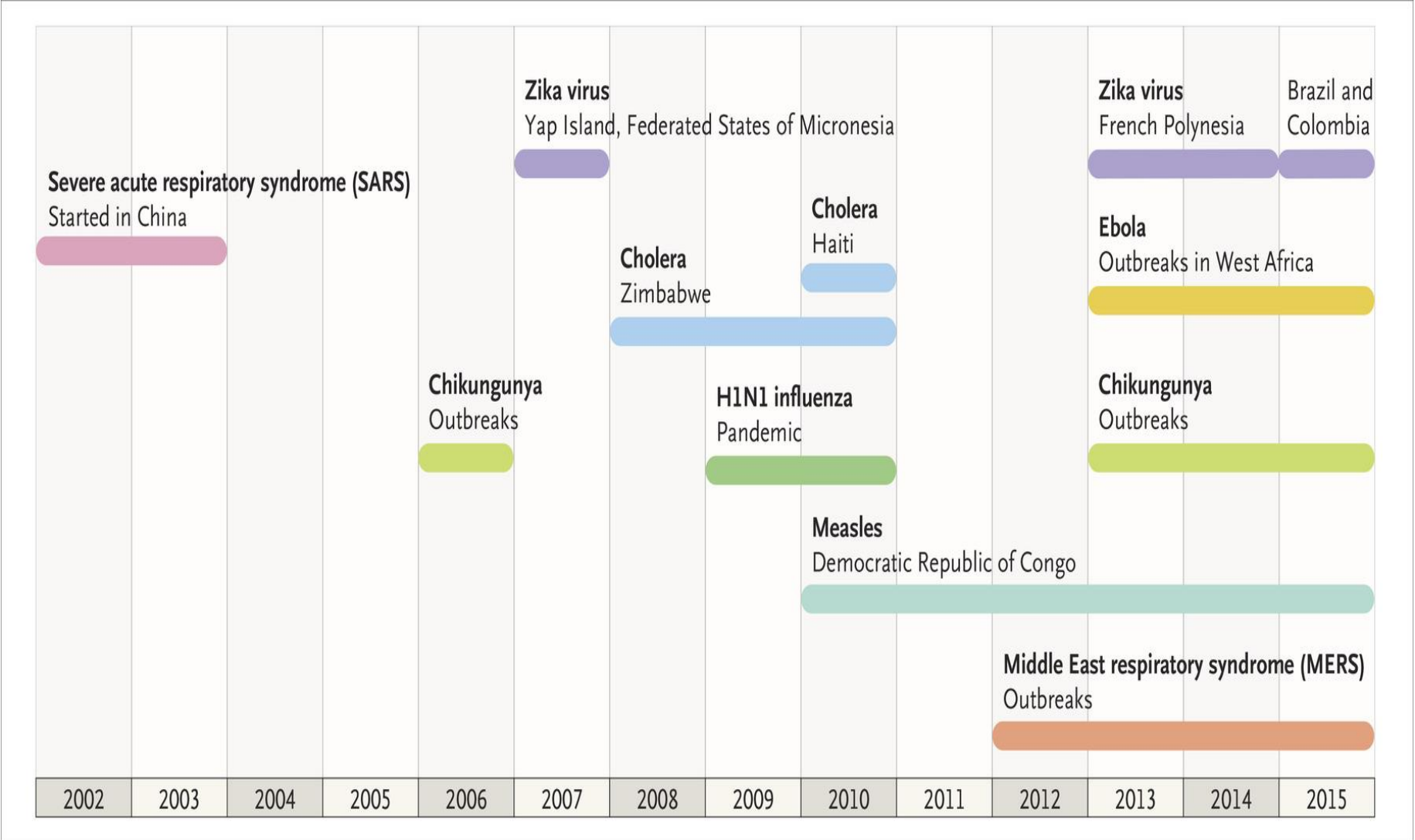
# Disease Risk

**Risk** =



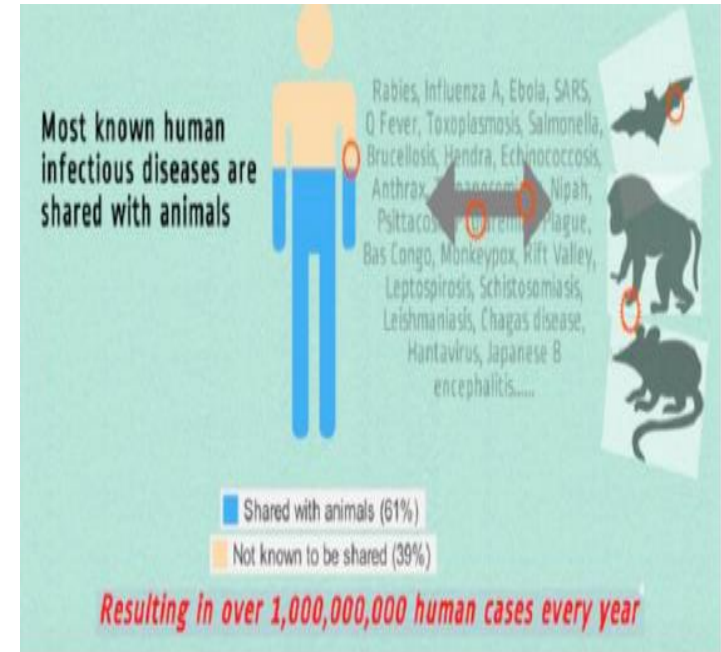
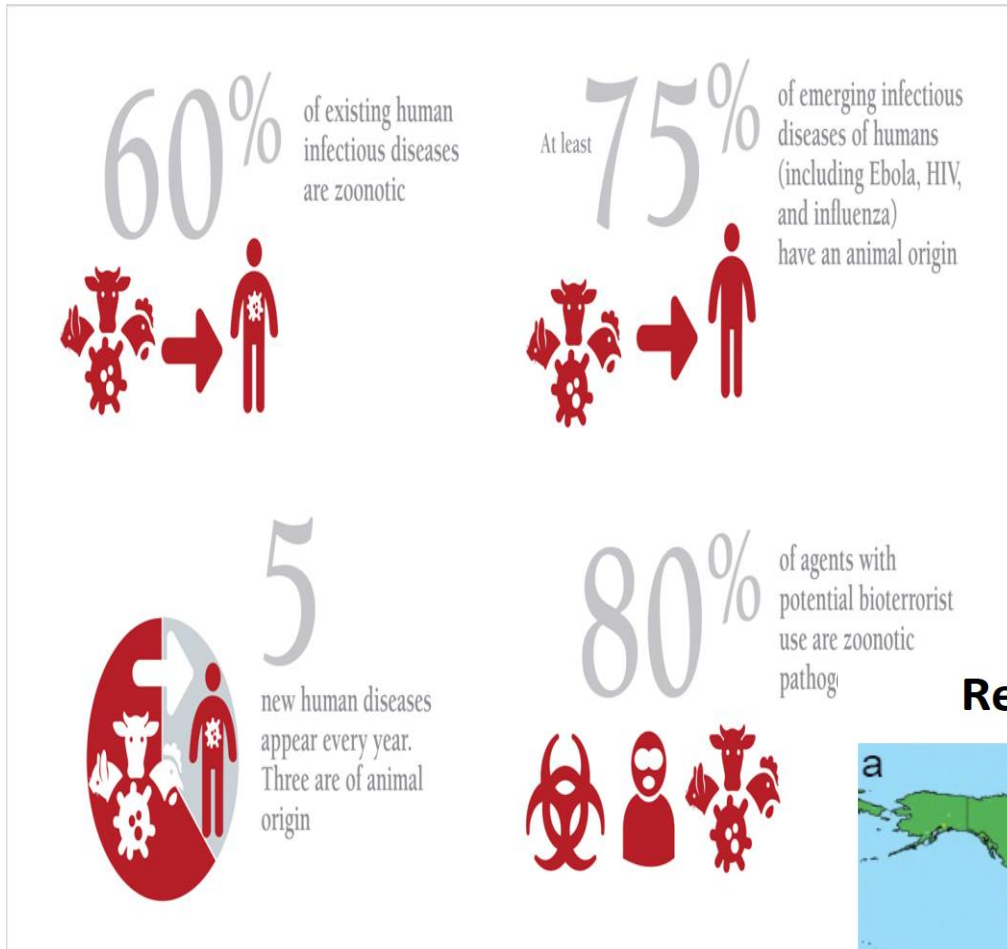
Coping Capacity

# Major Outbreaks, Epidemics and Pandemics 2002-2015

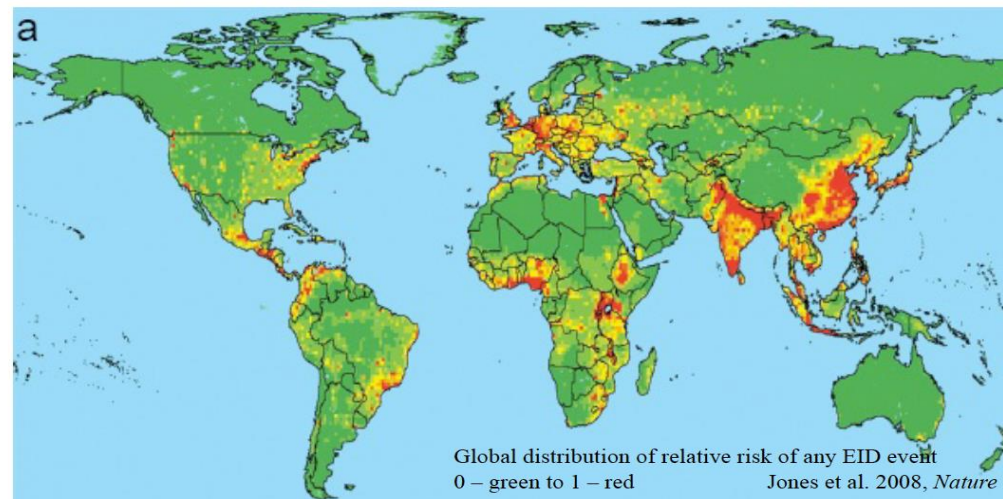


Source: NEJM Jan 13, 2016

# EID and Zoonoses: Facts not well known

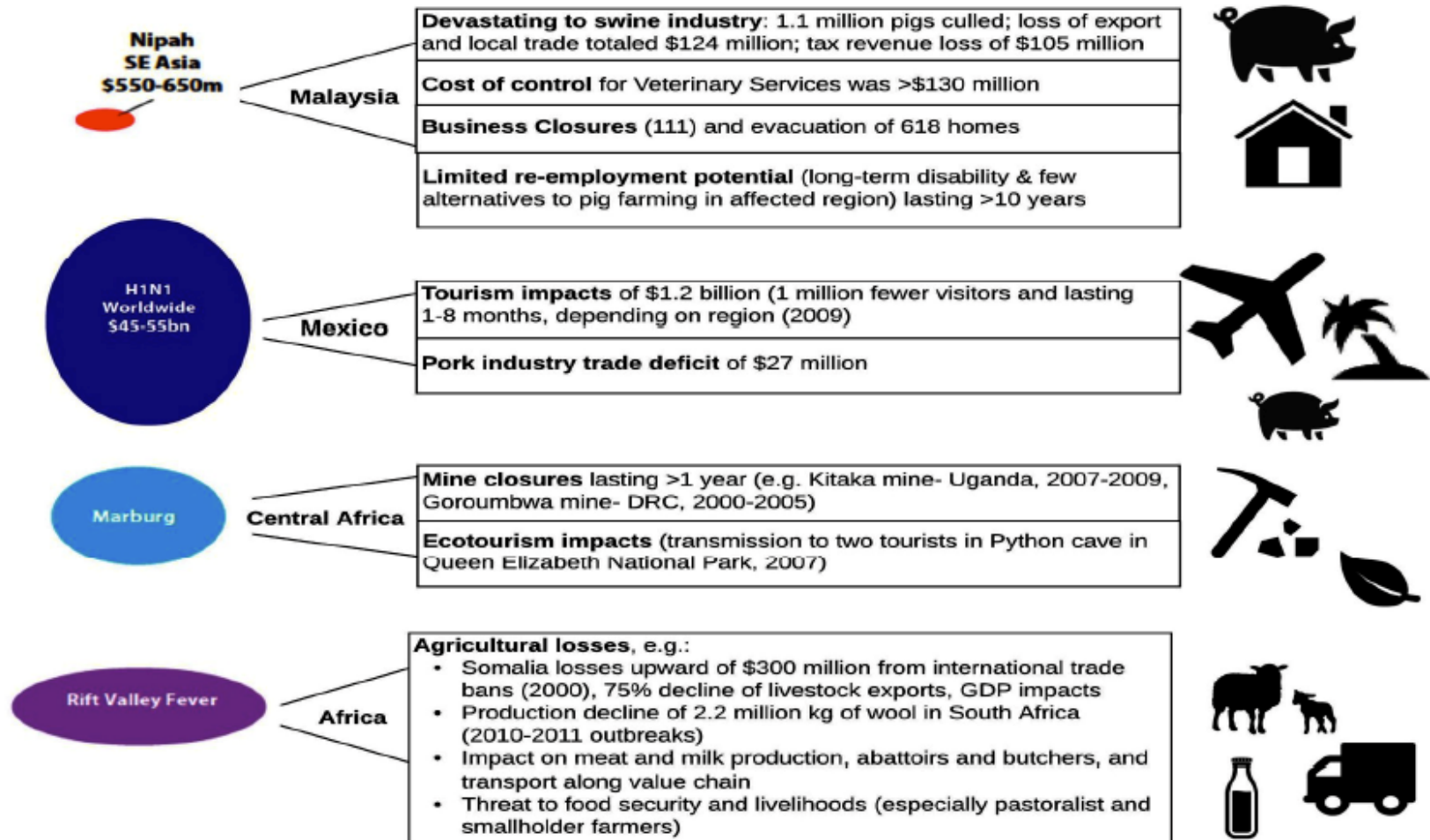


## Relative risk of a new zoonotic EID

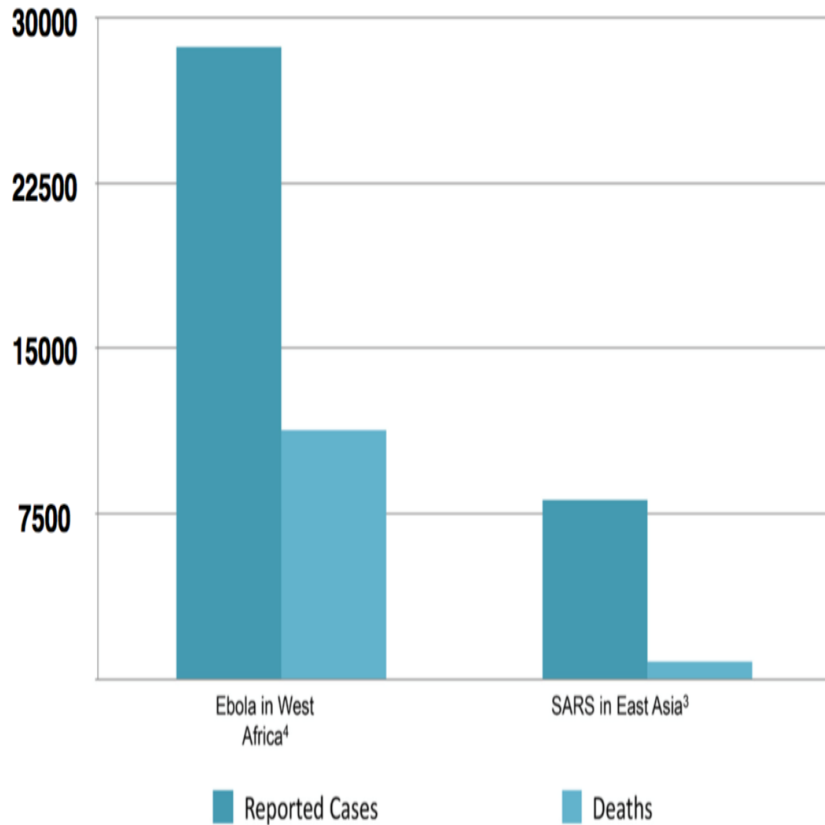


Source: OIE

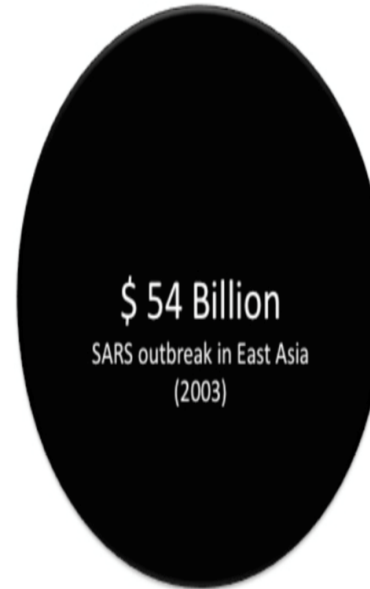
# ZOONOSES AFFECT A WIDE RANGE OF SECTORS



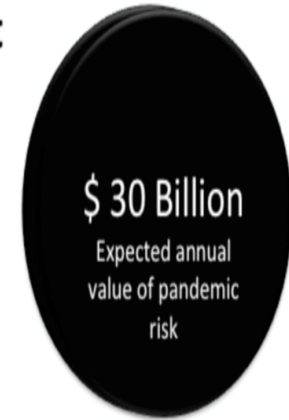
## Human Impact of Global Outbreaks



## Estimated economic impact of global outbreaks



Reactions by governments, businesses and consumers to the 2003 SARS outbreak (which was arrested after 8,000 cases and 800 fatalities) gave rise to economic costs of \$54 billion, confirming that impacts of contagion outside the health sector predominate, possibly by a very wide margin.



Pandemic risk has an annual expected value of an order of magnitude of \$30 billion, which is equivalent to more than one fifth of the average annual losses from all disasters in the past decade.

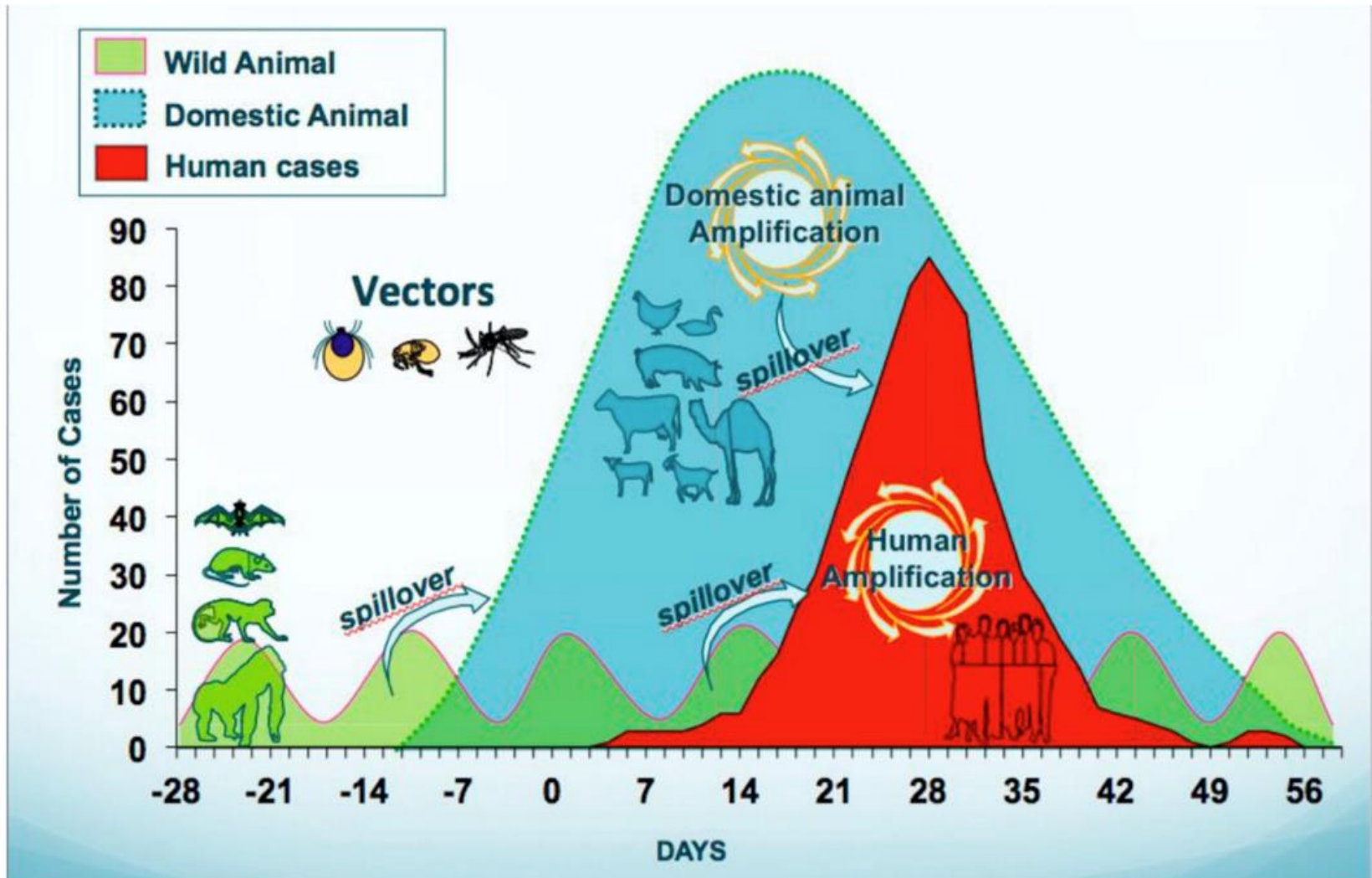


Guinea, Liberia and Sierra Leone will lose at least US\$2.2 billion in forgone economic growth in 2015 as a result of the epidemic

### Sources:

- World Bank Group Ebola Response Fact Sheet. The World Bank. (2016, April 6). Retrieved 26 April 2016, from <http://www.worldbank.org/en/topic/health/brief/world-bank-group-ebola-fact-sheet>
- Jonas, Olga B., Pandemic Risk, World Development Report. The World Bank., 2013 ([http://www.worldbank.org/content/dam/Worldbank/document/HDN/Health/WDR14\\_bp\\_Pandemic\\_Risk\\_Jonas.pdf](http://www.worldbank.org/content/dam/Worldbank/document/HDN/Health/WDR14_bp_Pandemic_Risk_Jonas.pdf) )
- Summary of Probable SARS Cases with onset of illness from 1 November 2002 to 31 July 2013. The World Health Organization.
- ([http://www.who.int/csr/sars/country/table2004\\_04\\_21/en/](http://www.who.int/csr/sars/country/table2004_04_21/en/))

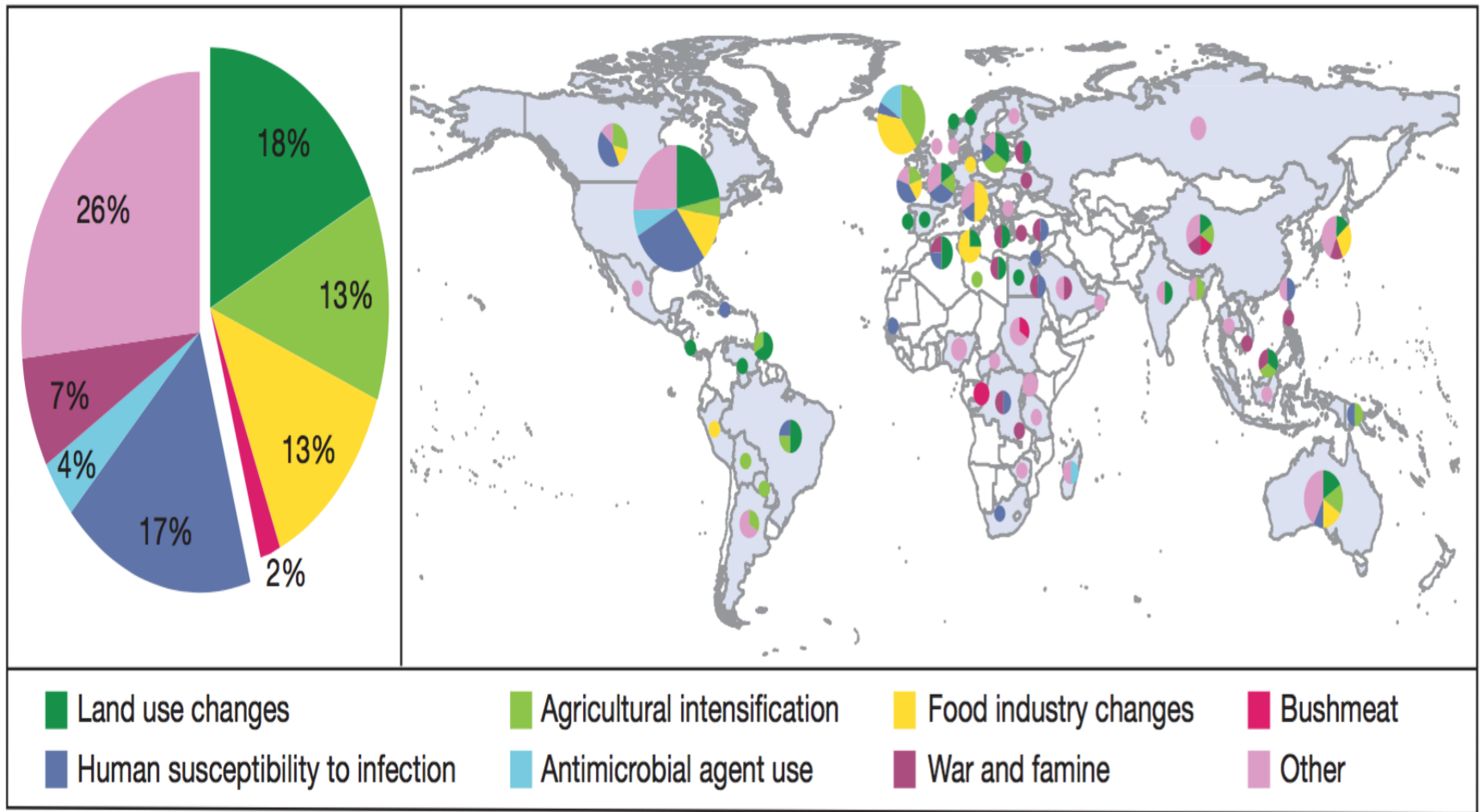
# Moving from Disease Response to Prevention



Source: Karesh et al. 2012. The Lancet & WHO



# Global and Country Level Drivers of Disease Emergence 1940-2005

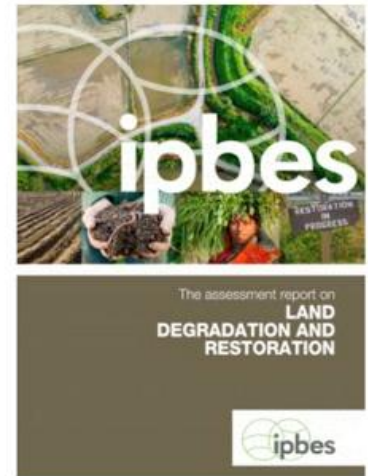
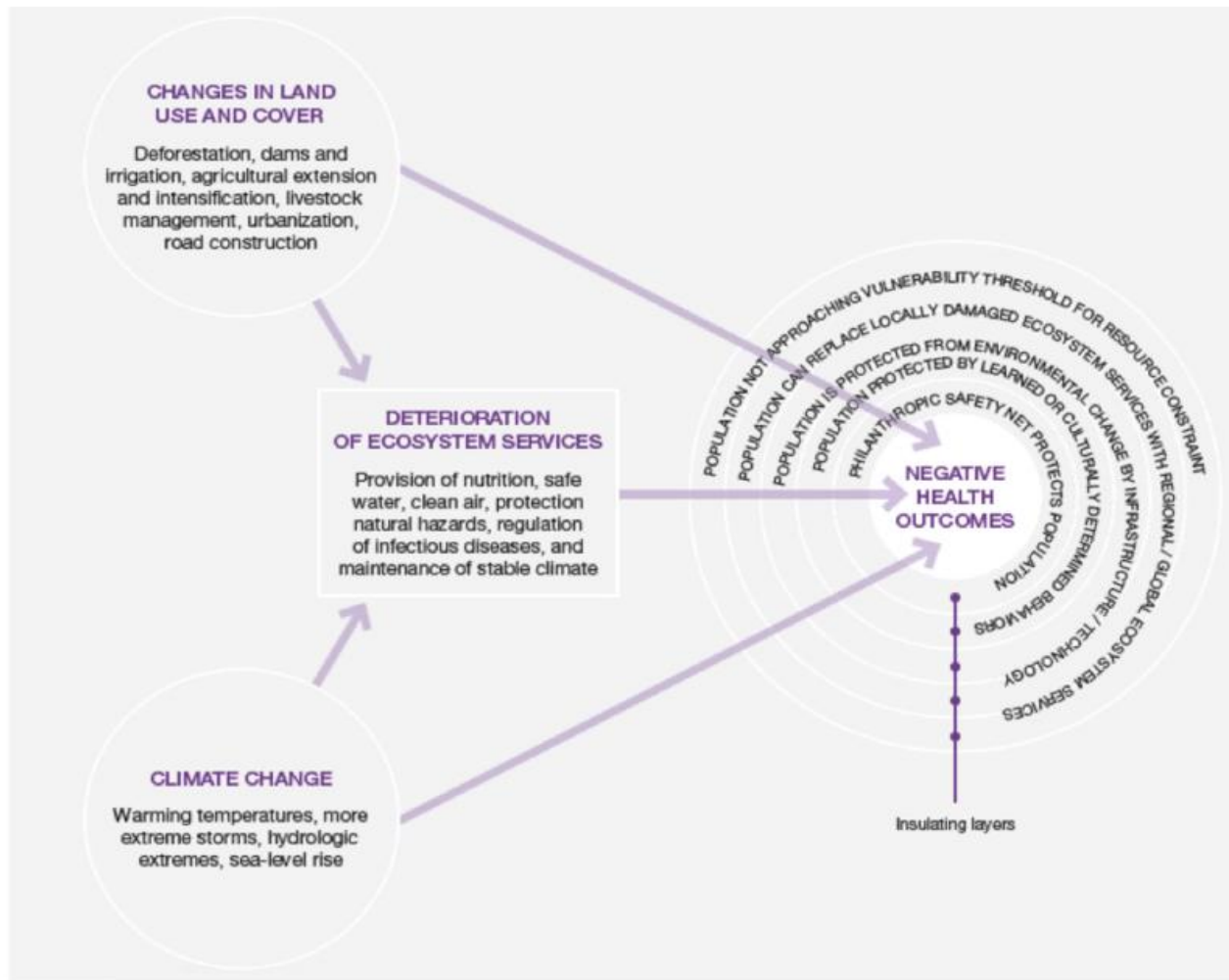


Jones et al. 2008, Nature

a, Worldwide percentage of emergence events caused by each driver;

b, Countries in which the emergence events took place, and the drivers of emergence.

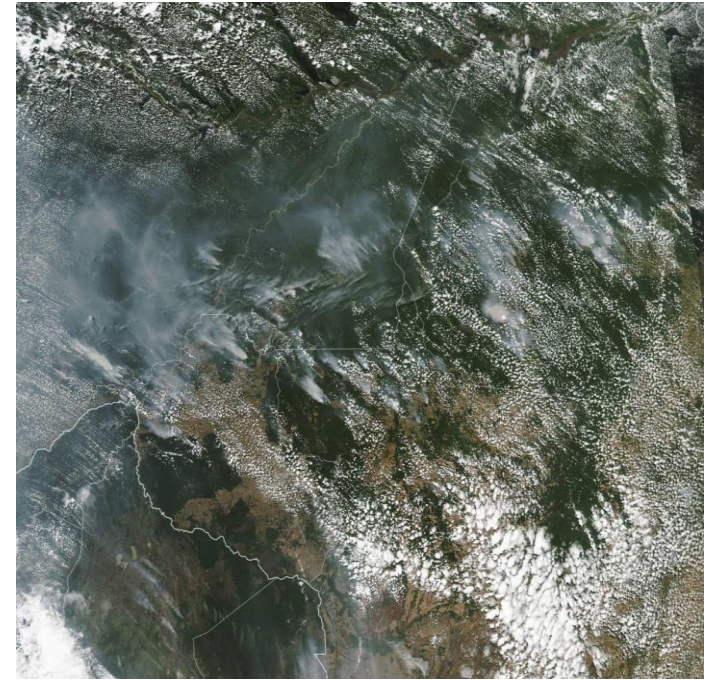
# Land Degradation, Mediators, and Health Outcomes



**Need for context-specific approaches**

# Deforestation

- Primary forest area has declined by 2.5% globally and by 12% in 2017 in the tropics, which contain some of the highest levels of biodiversity on Earth
- Land use change for agriculture represents the largest driver of land cover change. Together, croplands and pastures occupying 40% of the land surface. The rest is industrial for logging and mining
- Deforestation undermines its important carbon sink function. 15% of all GHG emissions are the result of deforestation.



Amazon under fire 2019



# Biodiversity loss impact on animal health

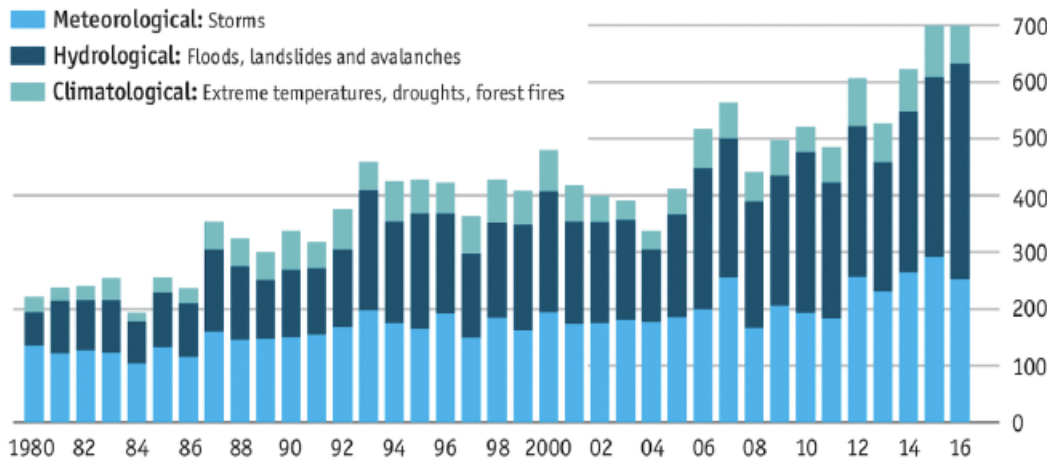
- **Biodiversity loss** and ecosystem change can increase the risk of emergence or spread of infectious diseases **in animals**, plants and humans, including economically important **livestock** diseases, zoonotic outbreaks and global pandemics.
- Impacting food security, dietary health, livelihood sustainability
- The decline in wildlife populations shown by the latest Living Planet Index – a 60% fall in just over 40 years – is a grim reminder and perhaps the ultimate indicator of the pressure we exert on the planet.
- Outbreaks of SARS, Ebola, Marburg, Hantavirus pulmonary syndrome, avian influenza and malaria have been attributed to human impacts on biodiversity, the wildlife trade or unsustainable land use change.

# Increasing Frequency and Impact: *Un-Natural* Disasters



## A rising tide

Natural disasters by cause



Source: Munich Re

Economist.com

**>20%**

of global deaths and disease burden linked to unhealthy environments

**More than 26,500 species are threatened with extinction**

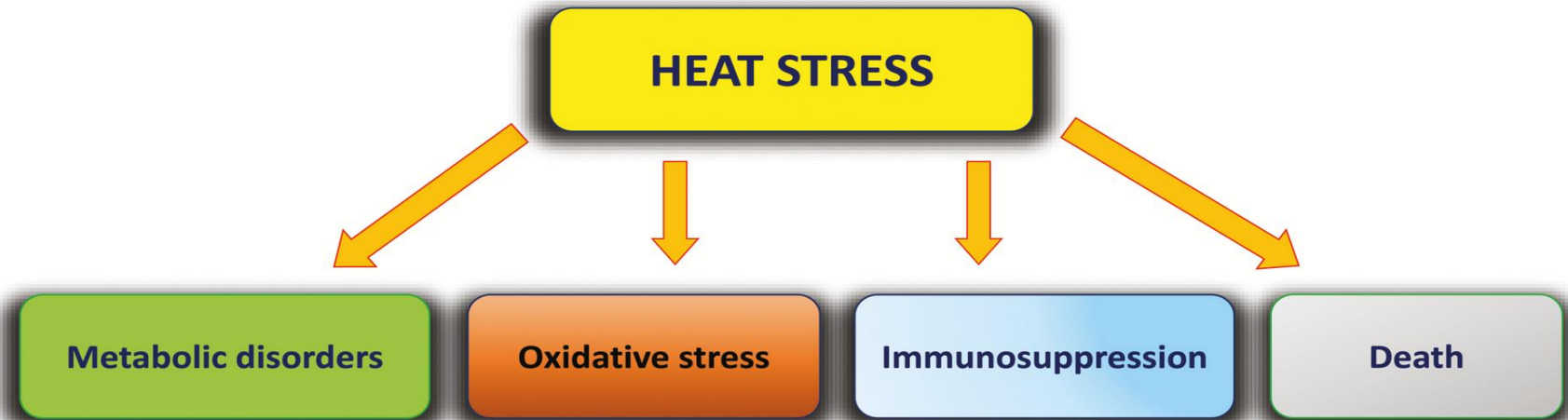
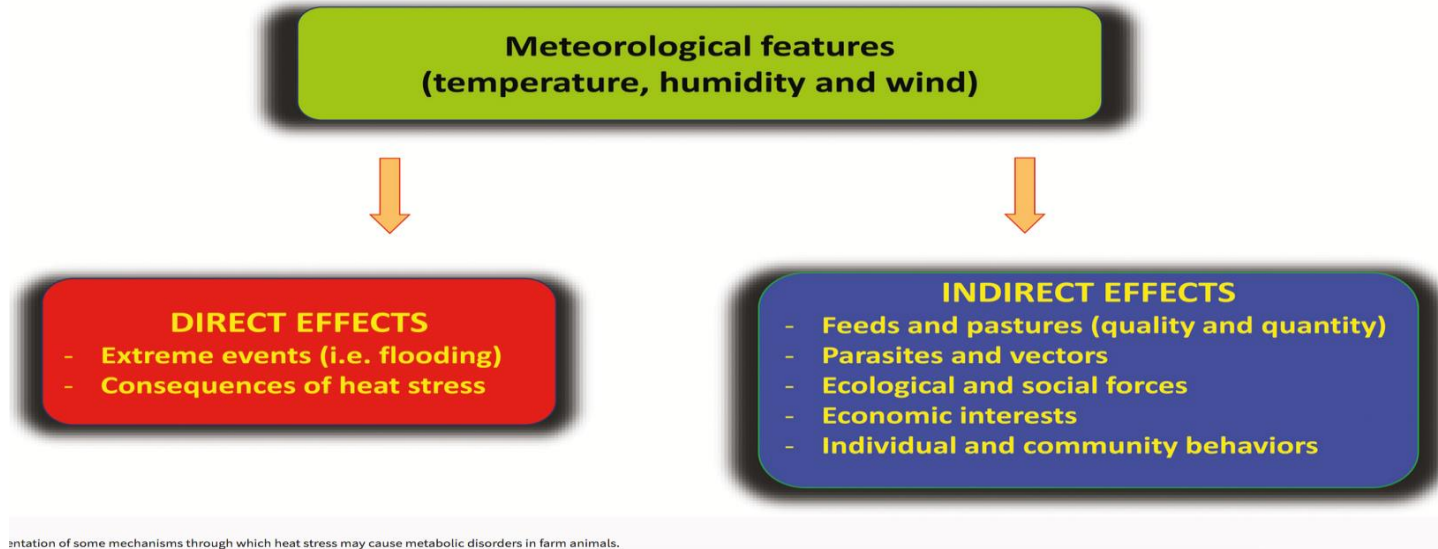
That is more than 27% of all assessed species.

AMPHIBIANS <b>40%</b>	MAMMALS <b>25%</b>	CONIFERS <b>34%</b>
BIRDS <b>14%</b>	SHARKS & RAYS <b>31%</b>	REEF CORALS <b>33%</b>
SELECTED CRUSTACEANS <b>27%</b>		

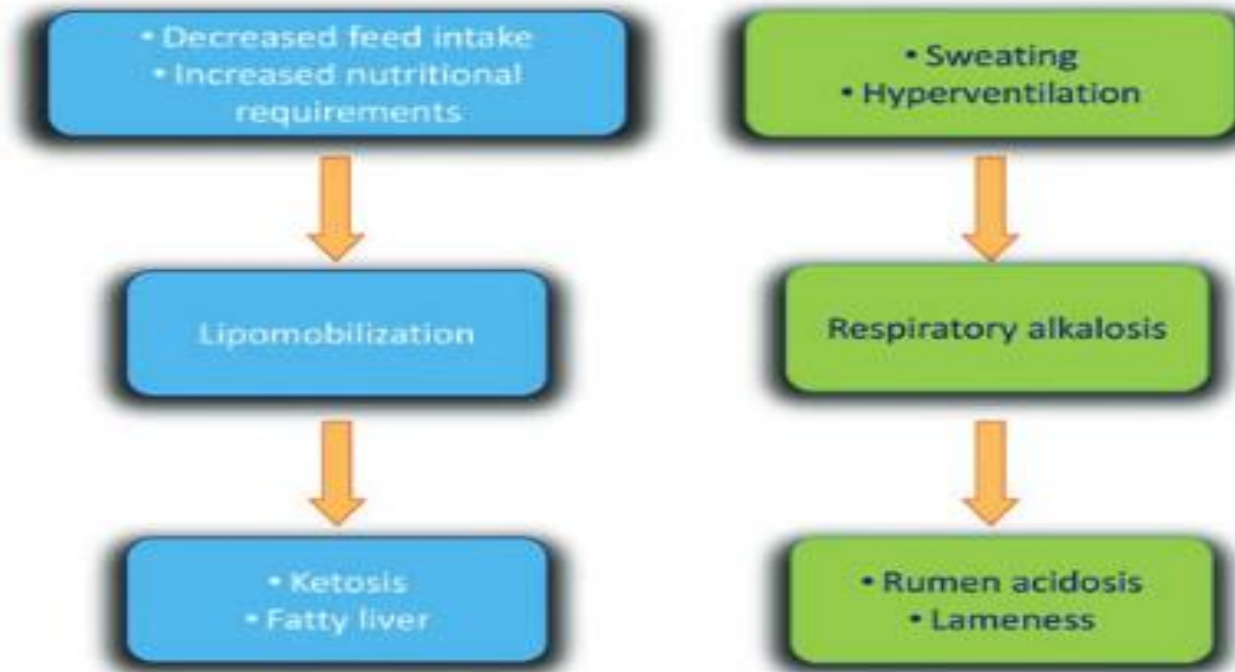
**US\$2.25 trillion** between 1998-2017 due to climate-related disasters

The Economist; UNISDR; World Health Organization, IUCN Red List of Threatened Species

# CC impact on Animal Health



# Climate Change Impact on Animal Health

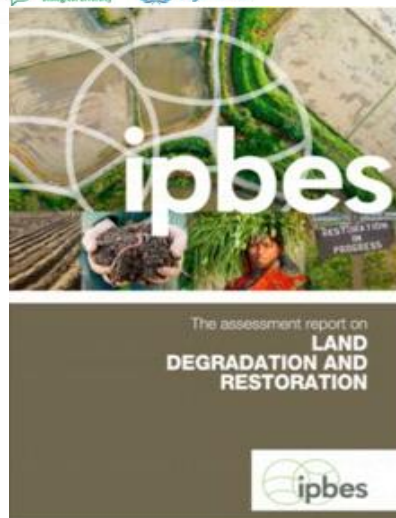
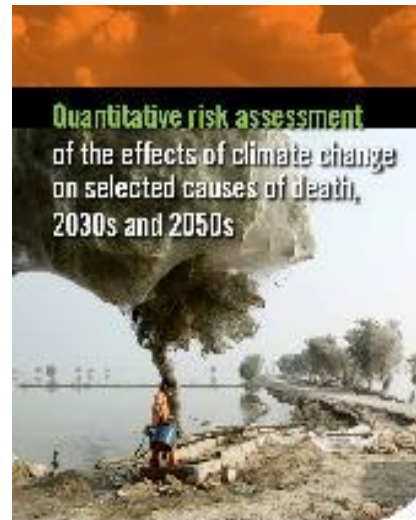
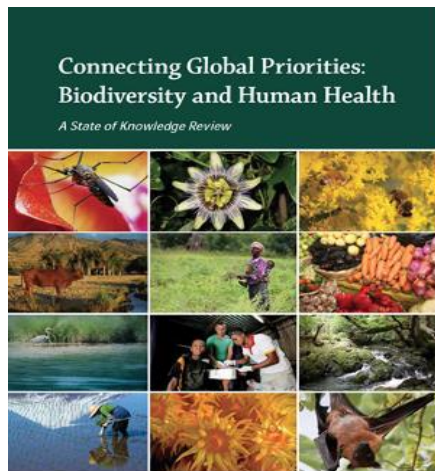


**Figure 1.** Schematic representation of the impact of climate change on animal health.

Lacetera , Jan 2019, Animal Frontiers

Development and application of tools and methods for an animal disease surveillance system linking climate data with disease occurrence should be implemented to prevent and/or manage climate-associated diseases.

# Generate and share knowledge and science-based evidence



Important source of evidence to support the implementation



# Risk Reduction

- Preparedness action is carried out within the context of risk management and reduction and aims to build the capacities needed to preventing new and reducing existing risks and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.
- Thus efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery.
- **Structural measures** are any physical construction to reduce or avoid possible impacts of hazards, such as the application of engineering techniques or technology.
- **Non-structural measures** use knowledge, practice or agreements to reduce disease risks and impacts, in particular through policies and laws and regulations, public awareness raising, training and education.



# Preparedness

The knowledge and capacities developed by governments, prevention, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters.



A **preparedness plan** establishes arrangement and appropriate responses to specific potential hazardous events or emerging situations that might threaten society or the environment.

# Preparedness elements

## Governance

- National policies and legislation that integrate emergency preparedness
- Plans for emergency preparedness, response and recovery
- Coordination mechanisms

## Capacities

- Assessments of risks and capacities to determine priorities for emergency preparedness
- Surveillance and early warning, information management
- Access to diagnostic services during emergencies
- Basic and safe health and emergency services
- Risk communications
- Research development and evaluations to inform and accelerate emergency preparedness

## Resources

- Financial resources for emergency preparedness and contingency funding for response
- Logistics mechanisms and essential supplies for health
- Dedicated, trained and equipped human resources for emergencies

# Preparedness Tools



Taking a Multisectoral, One Health Approach:  
**A Tripartite Guide to Addressing Zoonotic Diseases in Countries**



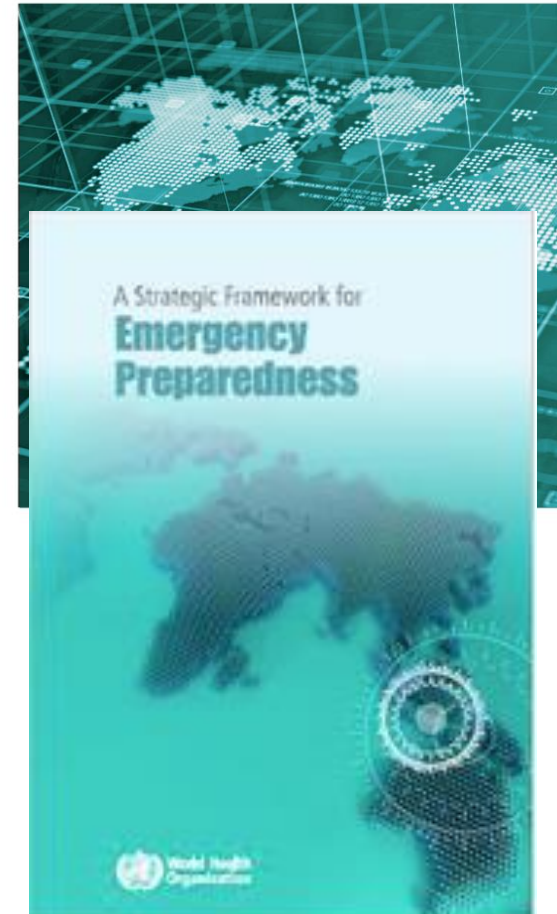
Food and Agriculture Organization of the United Nations | OIE WORLD ORGANIZATION FOR ANIMAL HEALTH | World Health Organization

TECHNICAL FRAMEWORK IN SUPPORT TO IHR (2005) MONITORING AND EVALUATION

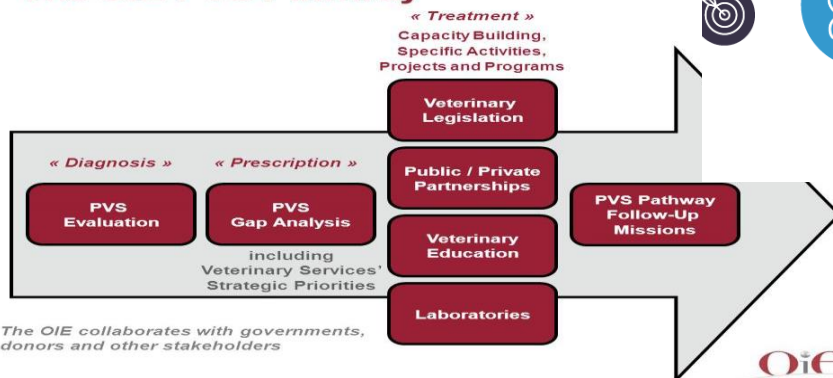
## JOINT EXTERNAL EVALUATION TOOL

SECOND EDITION - January 2018

INTERNATIONAL HEALTH REGULATIONS (2005)



## The OIE PVS Pathway



# JEE and PVS tools

JEE and PVS tools are the starting points to identifying gaps in preparedness and estimating funding needs.

**TABLE 3.1** JEE and PVS Status

	Both PVS and JEE	Only JEE (no PVS)	Only PVS (no JEE)	Neither PVS nor JEE
Low-income countries (IDA), excluding fragile and conflict affected states	14	0	25	8
Fragile and conflict affected states	7	1	18	8
Middle and high income countries	12	3	55	48
<b>TOTAL</b>	<b>33</b>	<b>4</b>	<b>98</b>	<b>64</b>

as of April 21, 2017

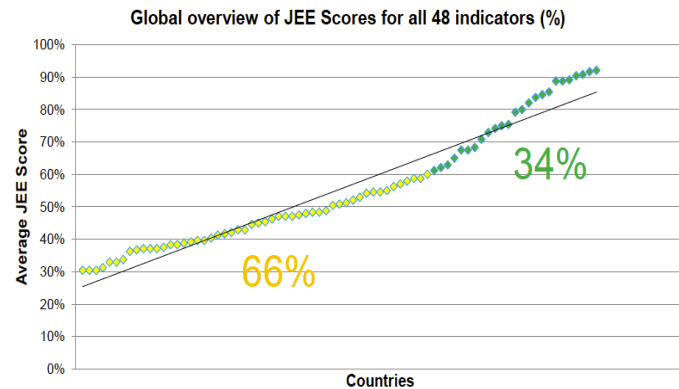
# Preparedness

## Key capacities in pandemic preparedness and response

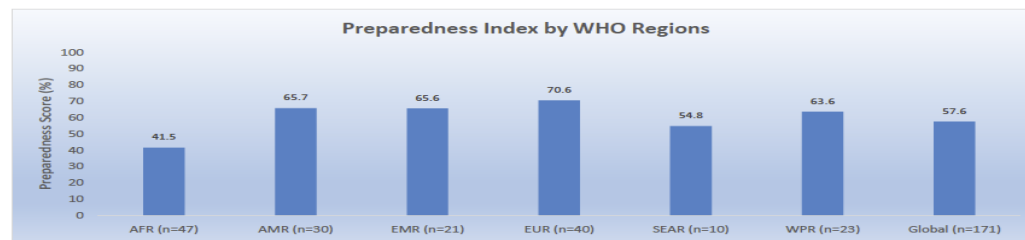
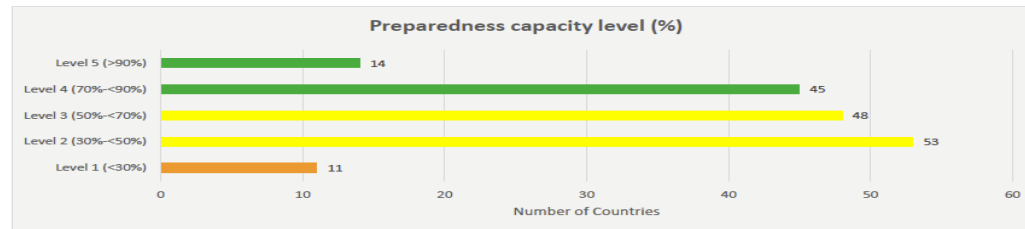
- Preparing for an emergency (planning, coordination and resources)
- Surveillance (laboratory, epidemiology or event), investigation and assessment (risk and severity)
- Health services and clinical management
- Preventing illness in the community (pharmaceutical and nonpharmaceutical interventions)
- Maintaining essential services and recovery



## Current level of Preparedness



## Current level of Preparedness



# Preparedness Status 2019

- The weakest area identified in the survey overall was the conduct of simulation exercises to test plans within the past 5 years (14.8%), with field, drill and functional exercises poorly represented in particular.
- Three of the four lowest scoring responses overall were:
  - Mechanisms for securing access to pandemic influenza vaccine during a pandemic (15.9%),
  - Regulatory pathways for the emergency use of pandemic influenza vaccines (21.2%) and
  - Specification of nonpharmaceutical public health measures in a pandemic (33.3%).

Countries were also weak in:

- Mechanisms for risk communication and community engagement (36.9%).
- Having established procedures to conduct systematic influenza risk assessment using surveillance data (40.4%).
- Having plans to cope with excess mortality during a pandemic (39.4%)
- Inclusion of recovery in national preparedness plans (50.0%).

# Financing Preparedness

- The cost of response and economic loss from a pandemic is estimated to be \$60 billion per year
- *Preparedness is relatively inexpensive and affordable;* it is estimated that \$4.6 billion per year is the financing gap for preparedness.
- Most countries would need to spend approximately **\$0.50-\$1.50 per person per year** to get an acceptable level of epidemic preparedness.
- Currently, there is no financing mechanism and no adequate incentive structure to motivate governments in high-risk countries to invest in preparedness.
- For most countries, this is less than 2% of what is spent on healthcare.



# Recommendations to enhance preparedness

## EXHIBIT 7.1 Tackling Pandemic Preparedness—Roles and Responsibilities

### All countries should:



Commit to strengthen universal health security



Assess their IHR core capacities and performance of veterinary services by conducting JEE and PVS by end 2019



Develop a prioritized and costed plan within 9 months of completion of gap assessment



Prepare a financing proposal within 3 months of completing a prioritized and costed plan



Engage and coordinate relevant stakeholders and develop a country-specific investment case



Examine ways of generating resources for preparedness from taxes



Regulate private sector investment in preparedness

### International development partners should:



Commit to strengthen universal health security



Commit support to finance preparedness activities and catalyze domestic resource mobilization



Leverage insurance models to support response and recovery, including the PEF2



Facilitate incorporation of economic risk for infectious disease outbreaks into macroeconomic and market assessments

### World Bank should:



Include preparedness indicators in the CPIA tool & IDA loan allocations



Include preparedness indicators in the country-specific systemic country diagnostics

# Solution: Integration

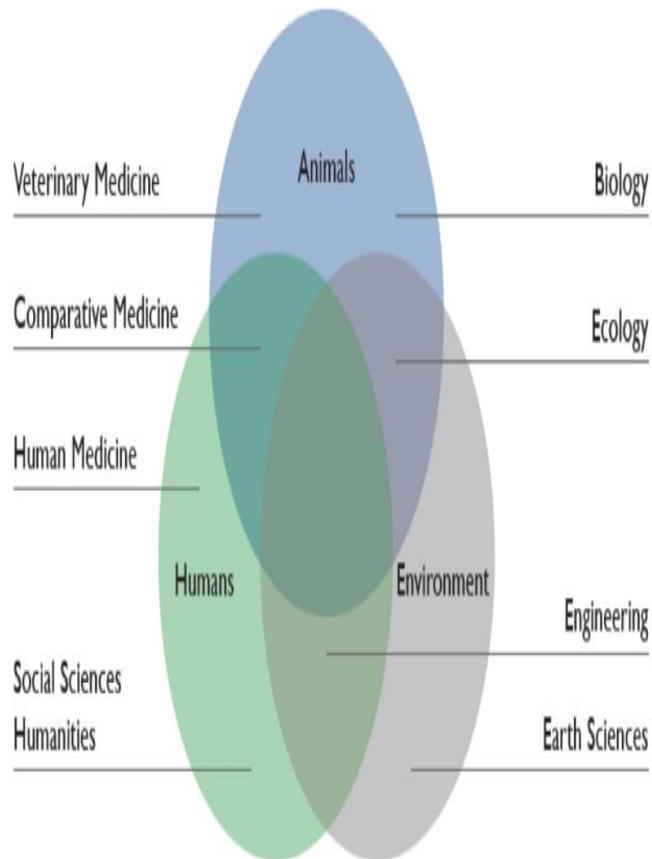
People-centred, all-hazards, and multi-sectoral - One Health approach

## 1. Mainstreaming Health into National Action plans

- Biodiversity
- Climate Change
- Disaster Risk Reduction
- Urban Agenda

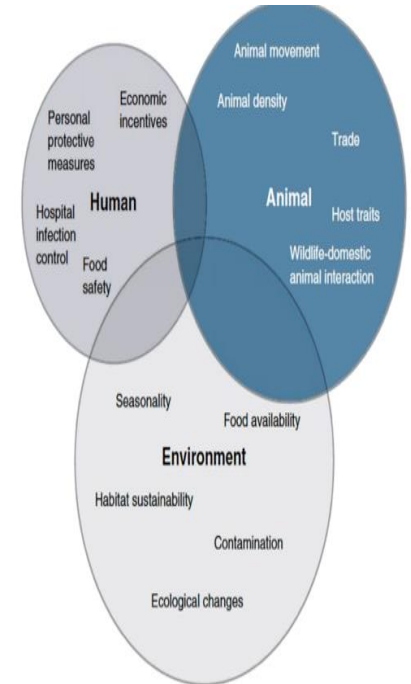
## 2. Mainstreaming climate risks into health systems

# One Health



## Context Matters for One Health Solutions

- Not everyone working together all the time....
- But strong human, animal and environmental health systems are needed to determine relevant sectors for a given objective, disease, or situation



### Example: Nipah virus

Flying fox bats serve as the natural reservoir for Nipah virus and have a direct role in recurring spillover events in Bangladesh. Hospital-acquired spread has been documented, but appears limited. Thus, animal and environmental contamination factors warrant emphasis.



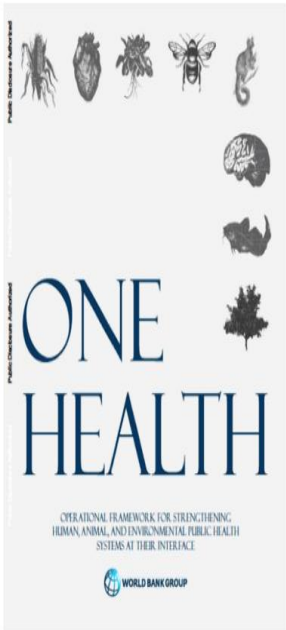
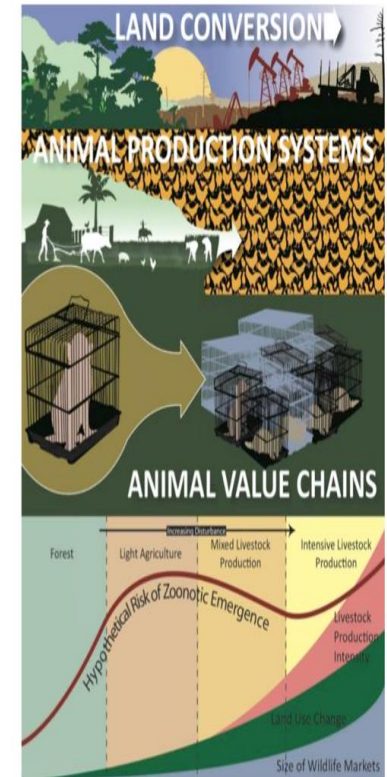
# Examples of implementation

## Operational Guidance

DOMAIN	STAGE			
	PREVENT	DETECT	RESPOND	RECOVER
III. Communication and information	<p>Access to information for risk assessment and mitigation: List of pathogens in country, list of known disease hosts and reservoirs in country, prior finding of exposure in country (e.g., antibodies to pathogen); risk forecasting e.g., weather data for climate-sensitive diseases</p> <p>Contacts established between ministries</p> <p>Chain of command for information reporting</p> <p>Population-specific and sensitive messaging (e.g., gender or cultural)</p>	<p>Chain of command for information reporting and verification</p> <p>Regional risk profile</p> <p>Population-specific and sensitive messaging (e.g., gender or cultural)</p>	<p>Chain of command for information reporting and action</p> <p>Pre-identification of risk factors likely to facilitate spread; multi-sectoral awareness of relevant risk and response protocols</p> <p>Ongoing coordination among authorities and between relevant ministries, affected sectors, logistical players (e.g., medical supply chain, treatment centers, vaccine producers, security), the media, and the public</p> <p>Population-specific and sensitive messaging (e.g., gender or cultural)</p>	<p>Multisectoral resilience planning and prioritization</p> <p>After-action review and refinement of communication/information dissemination strategies</p> <p>Population-specific and sensitive messaging (e.g., gender or cultural)</p>
IV. Technical infrastructure	<p>National, regional, or international access to laboratory diagnostics (known and novel)</p> <p>Sentinel surveillance in animals (wild or domestic) or vectors and investigation</p> <p>Hazard identification and other relevant stages of risk analysis</p> <p>Risk mitigation (e.g., at points of entry)</p> <p>Identification of vulnerable populations (heightened risk and/or</p>	<p>National access to laboratory diagnostics (known pathogens and toxicology); confirmatory analysis at reference laboratory, if needed</p> <p>Disease prioritization</p> <p>Detection at point of entry</p> <p>Identification of vulnerable populations</p>	<p>Risk management for disease control, including via contact tracing, awareness campaigns, etc.</p> <p>Medical treatment, where relevant</p> <p>Control at point of entry</p> <p>Containment to reduce potential for cross-border spread</p> <p>Identification of vulnerable populations</p>	<p>Health systems strengthening (general)</p> <p>Risk mitigation measures, e.g., universal vaccination campaigns</p> <p>Climate-smart and other resilient health care infrastructure</p> <p>Risk assessment refinement (e.g., with new epidemiological analyses)</p> <p>Continued medical treatment provision, where relevant</p> <p>Biosafety (facility and personnel)</p> <p>Identification of vulnerable populations</p>

## PREDICT-2 project

- 32 “hotspot” countries
- Integrated human and wildlife pathogen surveillance
- Behavioral risk survey
- Targeted to high-risk interfaces (local context)
- Generated biodiversity and health information; coordinated training, protocols and results interpretation



# Mainstreaming climate risks and biodiversity into health systems

- Develop the **capacity of the health workforce** to address climate and biodiversity risks
- **Reduce vulnerability and exposure to hazards and manage residual risks and uncertainties**
- **Integrated Health Information Systems** leading to informed health programming
- **Climate resilient and sustainable technologies and infrastructure**
- **Management of environmental determinants of health:**  
Air and water quality, food and nutrition security, housing and waste management
- **Enhanced emergency preparedness and management:**
  - Emphasize preparedness and prevention
  - Climate-informed preparedness plans, emergency systems, e.g. New health facilities and service routes should be appropriately located and adequately robust to be safe and remain functional during disasters
  - Community-based emergency management - empowerment
- **Scale up finance for health resilience to climate change and biodiversity**

## Final message

**PREVENTION  
WORKS!**



Addressing upstream environmental and biodiversity risk drivers using the OH approach must be part of national health policies and interventions, rather than vertical programs for single agents of disease.

We need to continue working together to  
make our world safer and more secure

Dr. Chadia Wannous

Coordinator,

Towards A Safer World Network

[cwannous@yahoo.com](mailto:cwannous@yahoo.com)

